Trends and attitudes in surgical management of benign prostatic hyperplasia

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Introduction: Surgical management of benign prostatic hyperplasia (BPH) has changed over the past 15 years with newer techniques emerging such as laser therapy that can be used with anticoagulation, an increasing issue with modern patients. We sought to evaluate current trends in procedure utilization based on age, location, type of practice, and experience. We also hoped to determine what factors influence surgeons' decisions to choose or reject particular surgical techniques.

Methods and materials: A 90-item on-line survey was sent via electronic mail to the American Urological Association (AUA), Veterans Administration, Society for Government Service Urologists, and Endourological Society. Data concerning utilization of 12 BPH surgical techniques were analyzed and compared to the surgeons' demographics using categorical data analysis and logistic regression.

Results: Of approximately 5500 urologists contacted, 600 urologists replied with 570 currently performing BPH surgery. The two procedures that continue to be utilized by urologists are open prostatectomy (OP) at 78% and monopolar transurethral resection of prostate (TURP) at 73%. When stratified by urologist age and year of residency completion, there were no differences in procedure utilization. There were no differences in types of procedures utilized between AUA sections except in the Northeastern

Introduction

Transurethral resection of the prostate (TURP) was first developed in the United States between the 1920s

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Address correspondence to Dr. Lori B. Lerner, Department of Surgery, VA Boston Healthcare System, 1400 VFW Parkway, West Roxbury, MA 02132 USA AUA section which utilized less monopolar TURP and the New York section which utilized less photoselective vaporization (PVP). Higher volume surgeons were more likely to perform holmium laser enucleation of the prostate (HoLEP), diode laser vaporization of the prostate, holmium laser ablation of the prostate (HoLAP), and thulium laser ablation. There were no trends for low volume surgeons. There were no differences in types of procedures performed in full time academic versus non-academic settings except for robotic prostatectomy and button TURP which were utilized more often in academic settings.

Urologists were more likely to accept a technique that produces good clinical outcomes, is safe in practice, and minimally invasive. Urologists reject procedures most frequently due to preference for another technique or lack of training/equipment. Interestingly, reimbursement/ cost issues were never reported as primary reasons for acceptance/rejection of any approach.

Conclusions: Change in technology has led urologists to change their approach to surgical treatment of BPH. OP and monopolar TURP are still the procedures utilized by most urologists, however, laser therapy is emerging as a commonly used technique. As more high-risk patients are treated, laser therapies may become a more popularized technique. Further larger scale studies evaluating surgeon attitudes might clarify how changing technology influences practice patterns.

Key Words: benign prostatic hyperplasia, surgical techniques, technology

and 1930s. Over the years, TURP has become the gold standard for the surgical management of benign prostatic hyperplasia (BPH) and has stood the test of time over other therapies that have since fallen out of favor, i.e. Vaportrode and visual laser ablation of prostate (VLAP).^{1,2} In the 1986 National Health Survey, 96% of patients had a TURP for BPH with approximately 350,000 claims submitted that year. However, more recent medical and surgical advances have caused TURP to decline over medical treatment and/or newer

approaches that have been deemed safer.³⁻⁵ In 2008, of the 90,171 claims submitted for BPH surgeries, only 46,829 (52%) were submitted for TURP, whereas 38,301 (43%) were submitted for laser therapies.⁶ These newer therapies have revolutionized the surgical treatment of BPH in many ways. In particular, as increasing numbers of patients require the use of anticoagulation, laser therapies have gained popularity due to their safety in therapeutically anticoagulated patients.^{3,4}

While Medicare data gives the distribution of claims via CPT codes, the data does not give specific information as to which resection or laser technique was used. What factors influence urologists to adopt these newer techniques or continue to utilize more traditional surgical approaches is not at all clear and has not been characterized. We sought to evaluate current trends in procedure utilization with regards to surgeon age, location, type of practice, and experience, as well as determine what factors might influence urologists' decisions to choose or reject a particular surgical technique.

Materials and methods

A 90-item survey was created which included 12 of the most commonly utilized BPH surgical therapies. Questions were directed towards why a surgeon would choose a particular technique over another, with investigation into the residency and/or fellowship exposure of the urologist. Attempts were made to capture as many reasons as possible for selection or rejection of a particular technique. Demographic questions were also included. The questionnaire was created through an on-line survey engine, Zoomerang.com, and was sent via electronic mail to all members on the e-mail listserves for the American Urological Association (AUA), Veterans Administration, Society for Government Service Urologists, and Endourological Society.

Data concerning utilization of each surgical technique was analyzed and compared to the surgeons' demographics using categorical data analysis. Logistic regression analysis was used to investigate trends of utilization by age, year of residency completion, section, procedure volume, and practice type. Statistical testing was performed with SAS 9.2 (SAS Institute, Inc, Cary, NC), and a p value of less than 0.05 was considered significant.

Results

Of approximately 5500 American urologists contacted, 600 urologists replied with 570 of those currently performing BPH surgery. Responses only reflect the 570 urologists who perform BPH surgery. The average age of urologists who perform BPH surgery

was 52. One hundred and ninety-three urologists (32%) were fellowship trained with 43 of these being trained specifically in endourology. The majority of fellowship-trained urologists completed a 1 or 2 year fellowship (63% and 26% respectively) which was not specific to endourology. Five hundred and twenty-six of the 570 urologists (92%) who perform BPH surgery utilize more than one BPH technique in practice, with a median number of 3 approaches per respondent (range 2-7). The 44 urologists who utilize only one BPH procedure perform: monopolar TURP (16); bipolar TURP (14); photoselective vaporization (PVP) (7); open prostatectomy (OP) (3); holmium laser enucleation of the prostate (HoLEP) (2); holmium laser ablation of the prostate (HoLAP) (1); and diode vaporization of the prostate (1). The mean number of procedures performed per year by each respondent was 52 (range of 2-350). Not all procedures were learned during residency and those that were had variable rates: monopolar TURP 87%; OP 77%; bipolar TURP 29%; PVP 26%; HoLAP 9%; HoLEP 3%. Table 1 illustrates the percentages of urologists who utilize the various techniques in their

Surgical technique	% of respondents who utilize the procedure
Open prostatectomy	78%
Monopolar transurethral resection of prostate (TURP)	73%
Photoselective vaporization (PVP)	58%
TURis button TURP	24%
Bipolar TURP	20%
Holmium laser ablation of prostate (HoLAP)	18%
Holmium laser enucleation of prostate (HoLEP)	8%
Diode laser vaporization	8%
Thulium laser ablation of prostate	4%
Robotic simple prostatectomy	3%
Laparoscopic simple prostatectomy	1%
Thulium laser enucleation of prostate	0%

TABLE 1. Percentage of urologists who utilize each **BPH** procedure, irrespective of volume



TABLE 2. Top three reasons selected by urologists for why they perform each technique**

**other options available but rarely selected included: good reimbursement; good published data to support the procedure; short operative time; short hospitalization; low procedure cost; and low equipment costs. TURP = transurethral resection of prostate; PVP = photoselective vaporization; HoLAP = holmium laser ablation of prostate;

HoLEP = holmium laser enucleation of prostate

practice. Percentages do not reflect the frequency at which urologists utilize the procedure but merely show that it is an approach they perform at least some of the time. There were no restrictions on the number of procedures a responder could choose.

Age and year of residency completion had no influence on technique utilization. There were no differences in types of procedures utilized between AUA sections except in the Northeast, where less monopolar TURP is utilized (p = 0.04), and in New York, where less photoselective vaporization (PVP) is utilized (p = 0.01). One hundred and fourteen (19%) urologists work in a full time academic institution. There were no differences in the types of procedures performed in full time academic versus non-academic settings except for robotic prostatectomy (RP) and Button TURP, which are utilized more often in academic settings (RP at 7% versus 2%, p = 0.002 and Button TURP at 28% versus 21%, p = 0.04).

The frequency of BPH surgery is relatively low with over half of responders completing < 50 procedures per year: 1-24/yr=23.4%; 25-49/yr=32.1%; 50-74/yr=22.5%; > 75/yr = 22%. For the majority of procedures, the techniques and volume of surgery performed per year showed no relationship. High (> 75 procedures per year) and low (< 25 procedures per year) volume surgeons performed those procedures equally. However, surgeons who utilize HoLEP, HoLAP, diode vaporization, and/or thulium laser ablation in their practice all fell into the high volume range.

The top three reasons urologists perform each procedure are shown in Table 2, with the most common reasons being good clinical outcomes (average 73%, range 56%-86%); safe for patient (average 64%, range 29%-86%); and minimally invasive nature (average 51%, range 0%-81%). Urologists reject procedures most frequently, Table 3, due to preference for another technique (average 43%, range 31%-68%) or lack of training and/or equipment (respectively average 30%, range 1%-57%; average 21%, range 2%-38%). Interestingly, reimbursement and cost issues were never reported as primary reasons for acceptance or rejection of any approach. Good reimbursement was selected < 8% of the time, except with laser (13%-29%) and laparoscopic approaches (43%), and was never one of the top three reasons a surgeon selected or rejected an approach. While not a priority factor, high procedure cost was most often selected for PVP (13%) and robotic prostatectomy (22%), but 0%-8% for all others. Most had no interest in learning other approaches (0%-8% for all procedures), except bipolar TURP, where 42% of responders replied "very interested".



TABLE 3. Top three reasons selected by urologists for why they reject each technique**

**other options available but rarely selected included: poor long term results; poor reimbursement; lack of safety; lack of published data to support the procedure; long operative time; procedure difficult to perform; high procedure costs; and high equipment costs. TURP = transurethral resection of prostate; PVP = photoselective vaporization; HoLAP = holmium laser ablation of prostate; HoLEP = holmium laser enucleation of prostate

Discussion

Given the advances and explosion of a large number of new BPH procedures that have become available, it is curious how urologists choose or reject a specific therapy. There is little literature available that investigates how surgeons make decisions. Other than asking surgeons and relying on honest responses, there is unlikely a more scientific method of determining this information. A 2011 study investigating rural surgeons found that while they have a good understanding of evidence-based medicine, they only find it somewhat useful but not very important to clinical decision making. Rural surgeons stated they are most confident in their own judgment and clinical practice guidelines and least confident in telephone contact with colleagues. Rural surgeons have contradictory, ambivalent and complex views of evidence-based medicine.⁷ It is clear that other factors are driving decision-making. We therefore created an extensive survey attempting to capture as much information as possible about decision making for BPH surgery and designed it in a way that allowed for analysis.

We postulated that younger urologists would be more likely to utilize the newer laser techniques as they may have learned them in residency and/or are more likely to have interest in learning new approaches. But in fact, age and year of residency had no bearing at all. This could be due to the low frequency with which laser therapies were taught in the residency programs of our responders suggesting that what they were trained to perform in residency is what they typically use in practice, or there are other factors driving their decision making. Certainly this indicates that older urologists further out of training are as likely to embrace new techniques as younger urologists and will often seek out training in these techniques on their own. In addition, it also shows that academic urologists still prefer to train residents in "older" therapies and that they are not yet ready to embrace newer approaches. This finding suggests that until residency programs begin to adopt and teach approaches other than TURP and OP, there is unlikely to be any significant change in practice patterns seen in the community. Urologists still choose procedures first and foremost based on clinical outcomes, which in the opinion of the authors is the most important factor for all surgeons. That said, the outcomes were likely in the opinion of the responder and how they perceived their patients fared as opposed to stringent evaluation of existing literature. Certainly that is true for some of the procedures that are lacking in publication and/or good randomized controlled trials. Our results suggest this to be true in that surgeons chose a technique based on "good published data to support this procedure" on an average of only 26% of the time (range 0%-59%) and rejected a procedure due to "lack of published data to support this procedure" very rarely at an average of 5%, (range 0%-14%). Several publications have supported that although physicians may subscribe to evidence based medicine, they don't necessarily apply it in clinical practice. A 2003 study of family physicians showed fully one-third of respondents rated their clinical practice to be only 20%-40% evidencebased. In fact, a sizeable proportion appeared to make clinical decisions that could be considered contrary to evidence. Patient expectations, behavior/demands and opinions affected many of their decisions, as well as factors that could be shaped by media, internet, and marketing.⁸ But as surgeons it is often said "we are as good as our last procedure" and anecdotal data is still valid, particularly as it impacts surgeon attitudes and procedure performance, and likely this affects use of BPH therapies.

We believed marketing and reimbursement would be strong factors in decision making for surgeons, but interestingly, they were not. This is not to say they had no impact as they clearly did, but they were not the driving factors. It is conceivable that urologists that have good industry contracts and/or relations may be influenced to some degree, or that the purchasing department of a hospital may prefer one company over another. If no strong data exists to support or reject one therapy over another (such as in the case with ablative laser therapies), industry relationships could impact a decision. Marketing may play a role in patient preferences, as stated in the paragraph above, and certainly some patients may request a certain BPH surgical approach based on what they have read or heard. However, we have no direct way of measuring this and it was encouraging that marketing and reimbursement were lower on the list of priorities for the surgeons themselves.

An interesting finding was the difference in some of the sections. We would have expected that all sections would be the same. Reasons for the differences could be marketing (perhaps strong relationships with certain industries have influenced purchasing in one section over another) and/or academic programs in a certain section may popularize a technique influencing practice patterns of the surrounding community urologists. Selection bias could explain these differences, but given the lack of statistical difference in response rates between sections, this is less likely. Regardless, sample size likely has some impact and is a limitation.

As expected, those procedures learned during residency and most commonly utilized by responders, TURP and OP, were performed by urologists across all volume ranges. Given that these are the most traditional techniques for BPH surgery, it is likely urologists find these therapies comfortable, relatively easy to perform, and they can be completed in a timely fashion. Other than PVP, practitioners who utilize the laser therapies HoLEP, HoLAP, diode, and thulium ablation, were utilized by high volume surgeons. PVP is considered easy to learn and perform, and this may explain its utilization by urologists across all volume ranges including those who do a limited number of BPH surgeries every year.^{9,10} HoLEP, however, is considered more technically challenging and once mastered, it is logical that HoLEP practitioners would use the technique and be higher volume surgeons. It is also possible that once a surgeon has taken the time in their practice to learn one of the newer modalities and has acquired the equipment, they are more likely to use that approach with their patients. The lack of volume differentiation with PVP can be explained by the large number of surgeons who utilize PVP over the other laser techniques (54% of responders use PVP versus < 20% for all of the other laser approaches), representing a larger sample size across all ranges.

Not surprisingly, robotic prostatectomy was utilized more in a full time academic setting. This is likely due to equipment availability and the experience of the academic attending who may do very little other than robotic surgery. It would be a natural extension for those surgeons to venture into BPH. Why button TURP would be more common in an academic setting is less clear. Given that it is easy to learn and perform, it does not seem that it would appeal to an academic surgeon over those outside of academics. We were surprised that there were not more differences between academic and non-academic environments likely supporting that all these procedures are considered reasonable options by most urologists.

The largest limitations of our study are the low sample size and lack of a reliable number of urologists who actually carry out BPH surgery. There are approximately 10,000 urologists in the United States.¹¹ Approximately 55% of these urologists were contacted through the AUA listserve yielding a response rate of 11% (600 urologists). However, one must account for the fact that a large number of urologists on that listserve do not perform BPH surgery, such as those specialty-trained in oncology, pediatrics, infertility, etc. We contacted the Endourological Society in an attempt to capture more responses from urologists who perform BPH surgery on a regular basis, which would strengthen the study, but many of those members were likely also included in one of the other e-mail listserves and would be overlaps. Urologists were asked to only complete the survey once even if contacted through several listserves. Review of the responses showed that no two responses were identical and we believe each response was unique. However, given the difficulties stated, we have no exact number by which to calculate an exact response rate. With that, we believe 11% is low and something closer to twice that, at 22%, is more accurate. In spite, the purpose of the study is not to change practice patterns or encourage utilization of certain techniques over others; it is more to stimulate thought into how urologists make certain preferences and develop biases especially with a wider range of BPH techniques being made available.

Conclusions

With the constantly evolving and changing environment of new therapies for the surgical treatment of BPH, urologists are continually exposed to new options. Their preferences for specific techniques may change, but the question is why. The growing population of anticoagulated patients is likely contributing to more frequent use of laser therapies. Neither age nor year of residency completion affects surgeon preferences, nor does it appear that residency programs provide training in newer techniques. It is encouraging to see that urologists mostly choose techniques based on good clinical outcomes, safety, and minimally invasive nature, and less so based on reimbursement. A larger study that incorporated more BPH surgeons might better delineate trends and attitudes, but the data presented here is informative and should stimulate personal reflection/ evaluation of one's own preferences.

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